

of assimilation? *If the disruption of carbonic dioxide within the cell furnishes oxygen directly*, how can any assimilating cell suffer from want of oxygen? Pringsheim does not admit the usual assumption italicized above. His opinion is that the analysis of the  $\text{CO}_2$  in assimilation does *not* directly furnish oxygen, but that some other substance is formed, which, passing diosmotically to the surface, breaks up and liberates free oxygen. He criticises the usual arguments based on the results of gas analysis. What the substance is which forms oxygen at the surface he is not prepared to state.

If this be so, the breaking up of  $\text{CO}_2$  and the liberation of O are two processes, distinct both in space and time, the one occurring within the cell, the other at its surface. This view is supported by reference to the peculiar liberation of oxygen exhibited in darkness by both green and unpigmented cells toward death. The bacterium-method proves this fact incontestably. This liberation of oxygen in darkness, quite independent of contemporaneous assimilation, may be termed "intramolecular liberation of oxygen," and, according to Pringsheim, the normal liberation is an essentially similar process, resulting from the disruption of an exosmosing substance.

He advances other arguments to show that we are not warranted in concluding, as has hitherto been done, that the presence of light, chlorophyll and  $\text{CO}_2$  exhausts the conditions of assimilation, and that in estimating its amount no other factors but light-energy and the absorption of light by the chlorophyll have to be taken into account. Assimilation is, on the contrary, a physiological function of the protoplasm, and, like movement, depends on the presence of free oxygen. Physiologists will look with interest for Pringsheim's detailed account of his investigations on this important subject.

**The proposed Botanical Exchange Club.**—The committee appointed by the Botanical Club of the A. A. A. S. at the New York meeting to act for the club in the formation of a Botanical Exchange, after considerable correspondence and the consultation of the rules and regulations of similar organizations abroad, is now in a position to submit to the members of the club certain tentative propositions, on which individual opinion is solicited.

The regulations of the Botanical Exchange Club of the British Isles, published in pamphlet form at Manchester in 1886, seem applicable to our needs, with certain necessary modifications. In order to bring these before the botanists of the country, a synopsis of them is here presented, arranged with reference to America instead of Great Britain.

1. The object of the club will be to facilitate the exchange of herbarium specimens of American plants, specially of rare species and varieties. The conditions of membership to be that each member shall furnish a parcel of specimens annually, and pay a yearly subscription of a

sum not to exceed (\$3.00) three dollars, to meet the expenses. Members will be entitled to a share in the distribution of specimens made in the early part of the year following that in which their subscriptions and parcels were sent.

2. The annual list of desiderata will be made up by combining those of all the members of the club, and then be printed and sent to every member. Each individual list must not exceed a certain number of species annually, for if unlimited the printed list would be too voluminous for practical use with our very extensive flora, at any rate for a number of years. The determination of the annual number of desiderata will require further consideration.

3. Some member will have to act as distributor each year, either voluntarily, or, if no one is found willing to act without recompense, provision will have to be made for employing a distributor at a small salary. The plan as here outlined would not necessitate very much work, and it certainly would be of an interesting nature. The committee will be pleased to receive communications relative to this.<sup>1</sup>

4 It will be necessary to adopt some one check-list as the official one of the club, and this must either be used in sending lists of desiderata by marking the species desired, or if a reliable numbered check list can be procured, the list of numbers might be sent. This is also a question for further consideration. It has been the experience of the British Club that manuscript lists of desiderata should not be received.

5. Each species should be represented by a number of specimens to be determined when the probable number of members shall be ascertained. It is not necessary to emphasize at this time the necessity for complete and satisfactory specimens being furnished, with appropriate labels.

The British Club in 1886 had a membership of fifty-eight, and has been in successful operation for a number of years. It would seem certain that at least an equal number of American botanists would consider it advantageous to join a similar organization.

Suggestions regarding the matter here presented and applications for membership should be sent to the chairman of the committee, Dr. George Vasey, U. S. Department of Agriculture, Washington, D. C.

THE COMMITTEE.

**Phacelia heterosperma.**—Annual, a foot or less high, with erect branches, glandular and viscid, the foliage and inflorescence with sparse short and viscid hairs: leaves few on short petioles, ovate, an inch long, with a few coarse angular teeth, or the basal ones nearly entire: flowers in strict spiciform racemes, at length elongated and loose: corolla com-

<sup>1</sup> Dr. Vasey writes that Commissioner Colman has consented, if it be deemed advisable, that the Botanical Division of the Department of Agriculture take charge of the exchanges and distribution without expense to the members of the club. N. L. B.